

ESD Informal Education and Public Outreach 2007

Based on NASA Education Strategic Framework

Higher Education

Employ

Elementary/secondary Education

Educate

Science on a Sphere

Magic Planet

Provides direct support for formal education programs

Reaching
10's of
millions

Engage

Informal Education

Earth To Sky EEI ViewSpace

Earth Today Magic Planet Science on a Sphere

Inspire

SVS assets

Footprints Class products

Our compelling science content tells our story across a mix of venues and platforms



Informal Education

Selected Programs and Platforms

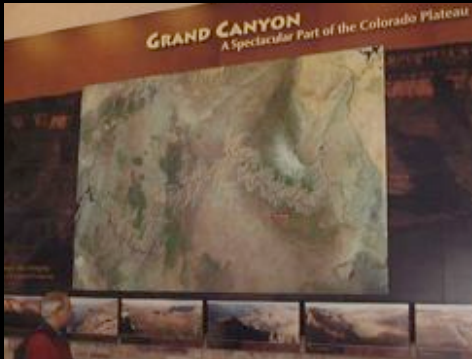
- ❖ **Earth Explorers Institute** (David Herring)
- ❖ **Earth To Sky** (Anita Davis)
- ❖ **Art in Science** (Michael Starobin)
- ❖ **ViewSpace & Magic Planet** (Steve Graham)
- ❖ **Earth Today** (Barbara Schoeberl)
- ❖ **EOS Aura** (Maurice Henderson)
- ❖ **SOS User Group** (Maurice Henderson)



Earth to Sky: An Innovative Partnership

<http://www.earthtosky.org>

Actively fostering collaborative work between the science and interpretation/education communities of NPS and NASA.
Ultimately enriching the experiences of millions of park visitors.



Audience

Proximate

NPS Ranger Interpreters and Trainers



NASA Science Content

- Earth System Science
- Astrobiology
- Comparative Planetology
- Sun-Earth Connection
- Space Science



Ultimate

Visiting public at National Parks

- 273 Million+ recreational visits to America's National Parks in 2005
- NPS National Survey (2000)
Over 1/3 of the US population visits a National Park unit in the course of two years



**54 National
Park Sites**

***Earth to
Sky
Workshops
2004-2005***

**Informal Education,
NASA Headquarters**

**60 Interpretive
Rangers**

**NASA Scientists &
E/PO Personnel**

**NPS National Capital &
Pacific West Regions
NPS Mather Training Center
National Program Manager**

**Goddard Space Flight Center
AMES Research Center
Jet Propulsion Lab**

Collaborative Partnership

**Two-tiered
Training
Strategy**

- 10 Interpretive Facilitators
- 50 Interpretive Rangers =
- 60 Interpreters trained with transferability to others in NPS

**Two tiers
of
Results**

Year Two 2005-2006



Exemplary products developed for use in future professional development

- Sun-Earth Connection at Bryce Canyon
- Global Climate Change Tutorial

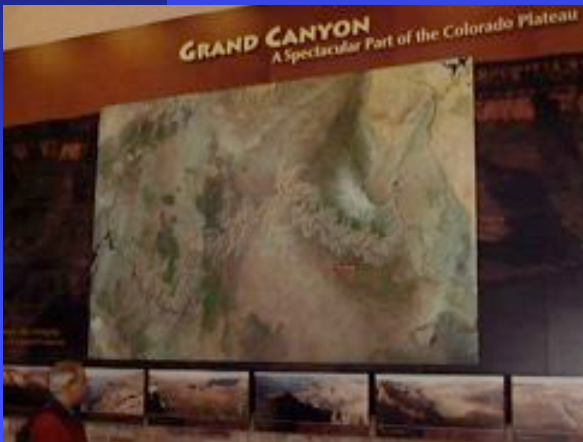
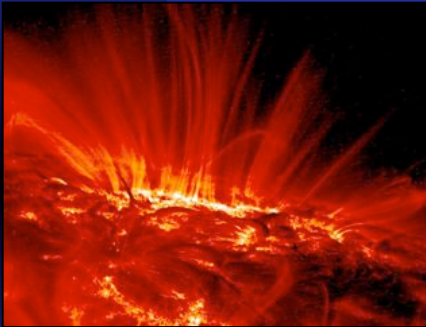
Web Site established <http://www.earthtosky.org>

Professional Development

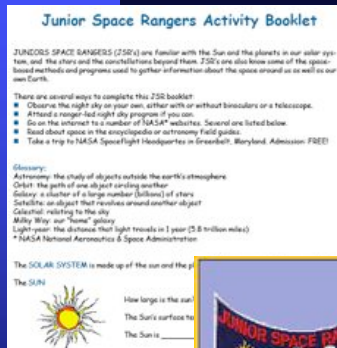
- National Interpreters Conference (>50)
- Astronomical Society of the Pacific (30)

Collaborative spin-off projects under development

- Mars Public Engagement Team + Landsat/LDCM
- Grand Canyon animation fly-through
- Astronomy 101
- Teacher workshops



Millions of Visitors are Learning about NASA Science at Parks throughout the Nation



Jr. Space Ranger Activities and Badge Delaware Water Gap



Climate Change in Parks brochure, tutorial, and display for use nation-wide



Never Summer, Ever Summer Rocky Mountain National Park Interpretive Program



Life/Water Connections on Earth and Mars, K-12 Curriculum Amistad National Recreation Area

Night Watch/Sky Watch: The Universe Through the Lens of Science and the Native American Perspective Canyon de Chelly

FTE and Sponsorship

LDCM/Landsat .25 fte

Sun-Earth Connection UC Berkeley .25 fte

Funding source NASA Explorer Institute Grants
200 K year one; 150 k year two

Extensive NPS and NASA In-kind Contributions



Future Goals

- Deepen and broaden partnership
- Build sustainability
- Provide more in-depth, high-quality professional development
- Conduct intensive evaluation of effectiveness

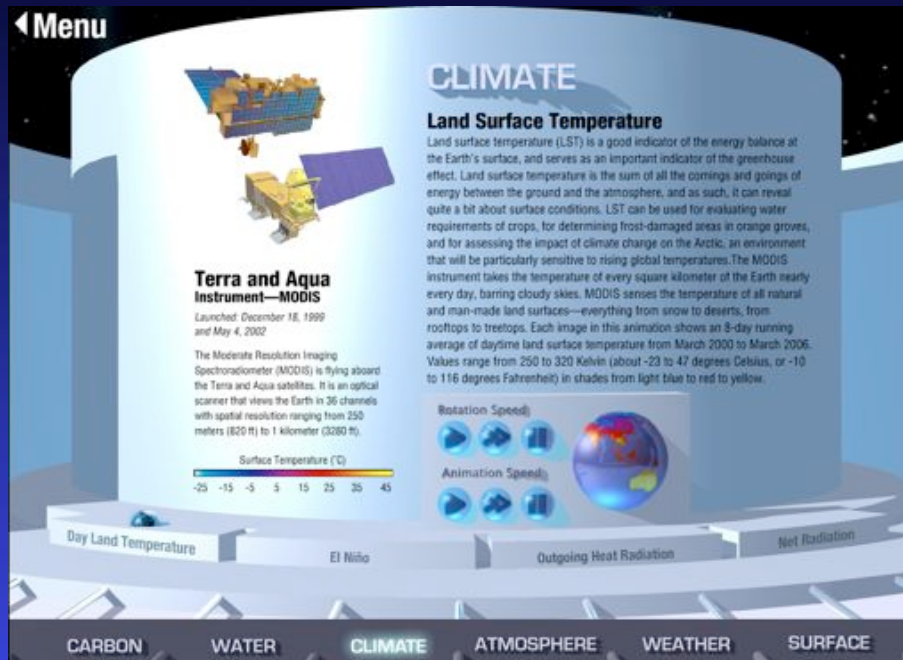


Informal Education

Art in Science Communications:
Create Stickiness

Michael Starobin

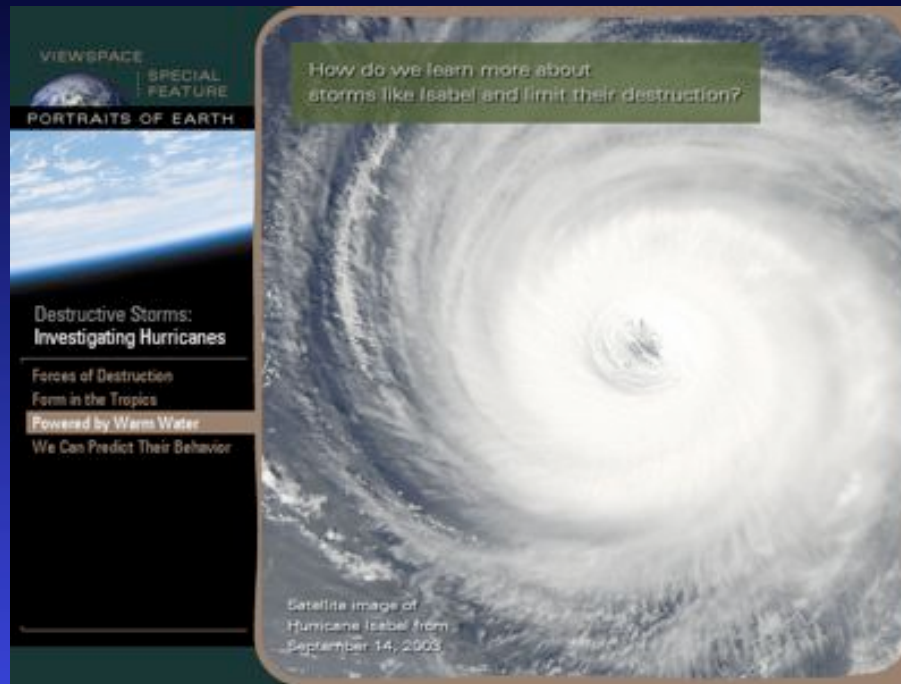
NASA's Magic Planet



A digital video globe that allows users to view and explore dynamic digital images of the earth and other planets.

- Currently, 24 data sets categorized by 6 science themes
- Development has begun on a new touch screen interface to integrate all the divisions of the Science Mission Directorate
- Conference exhibits, launches, Smithsonian Museum of Natural History exhibit on climate change, and (soon) Goddard Visitor Center

ViewSpace



A popular and growing network of astronomy and Earth science exhibits from the STScI. Implemented at science centers, museums, planetaria, nature centers, and libraries.

- Relevant science data from NASA's Earth Science missions is frequently featured in the form of:
 - Earth image of the day - a simple template driven design using a new satellite image, title and interpretive caption, leveraged heavily from the Earth Observatory Image of the Day and Natural Hazards Websites
 - Earth Science features - 5-10 minute feature on a relevant and timely Earth science topic. To date, three features have been produced; Invasive Species, Hurricanes, and the Cryosphere



Informal Education

Earth Today: A unique platform for
delivering near-real time views of
Earth Science data

Barbara Schoeberl

**EOS Aura – Informal
Education
2005–2008**

*Based on NASA Education
Strategic Framework*

Employ

Support for
Medgar Evers
College ozone-
sonde launches

Higher Education

Educate

Publish brochure of science results
Develop data-rich inquiry activities
using MyNASADData (with LARC)

**Elementary/secondary
Education**

Conduct workshops for teachers, build network:
GLOBE in CA; NASA Explorer Schools;
Maryland Assn of Environmental and Outdoor
Education; Maryland Backyard Habitat Program;
EET chapter on climate change using Aura data

❖ **Informal
Education →**

Engage

Smithsonian exhibit, “Change Is in the Air;” moving to GSFC
Visitor Center; Aura Ozone Monitoring Garden at GSFC VC;
Workshop for Girl Scouts; data for Earth Today and Science on a
Sphere; Ideas and resources for SOS stories; Science Cafes

Inspire

Aura Web site, Science on a Sphere

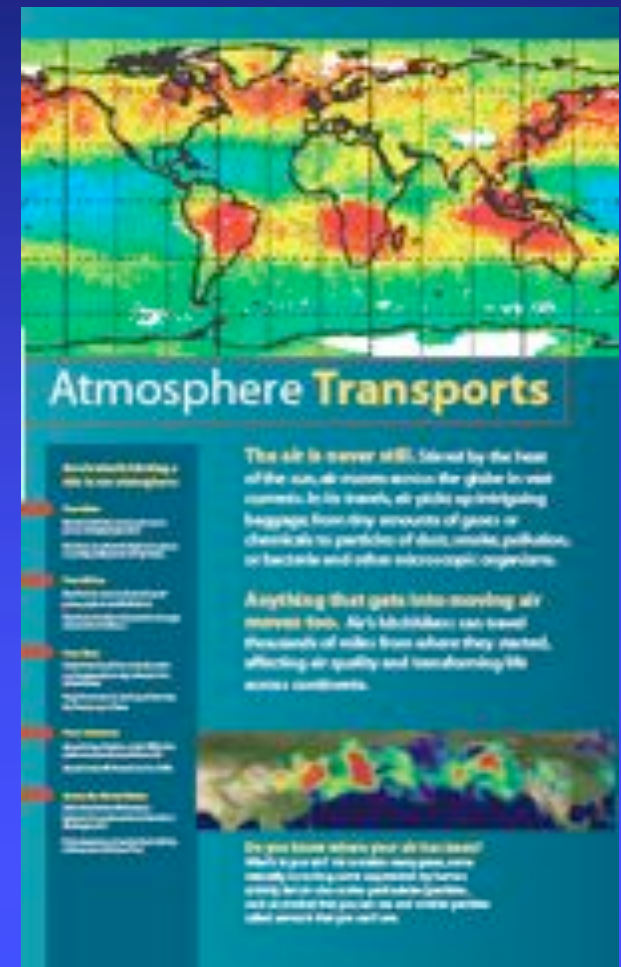
Aura Informal Education

Product: “Change Is in the Air” exhibit at Smithsonian Institution and at GSFC Visitor Center

Description: Multimedia exhibit about atmospheric transport, chemistry, and air quality at the National Museum of Natural History (2006) and GSFC Visitor Center (2007)

Target audience: General public; museum, science center visitors

Metrics: Smithsonian Evaluation



Aura Informal Education

Product: Earth Explorer Institute, “Earth by Aura: Ultraviolet Radiation Data Collection by and for the Public”

Description: Partnership with Maryland Science Center and Bishop Museum to teach the public about UV radiation

Target audience: General public; museum and science center visitors

Metrics: Monthly progress reports from partnering museums

BISHOP MUSEUM



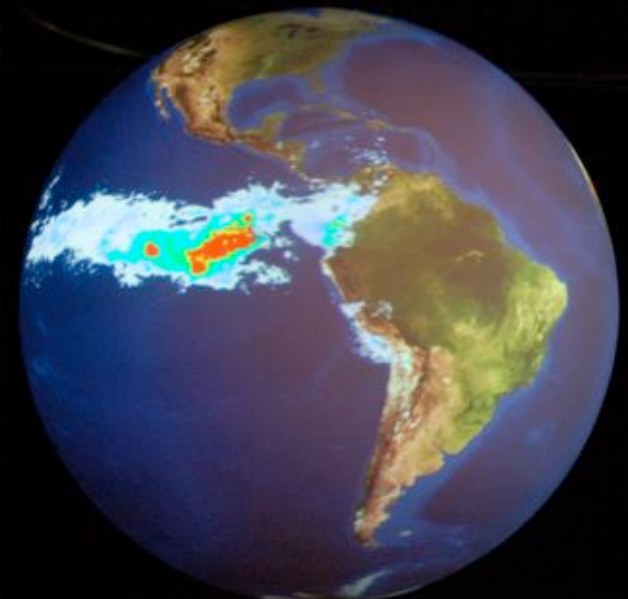
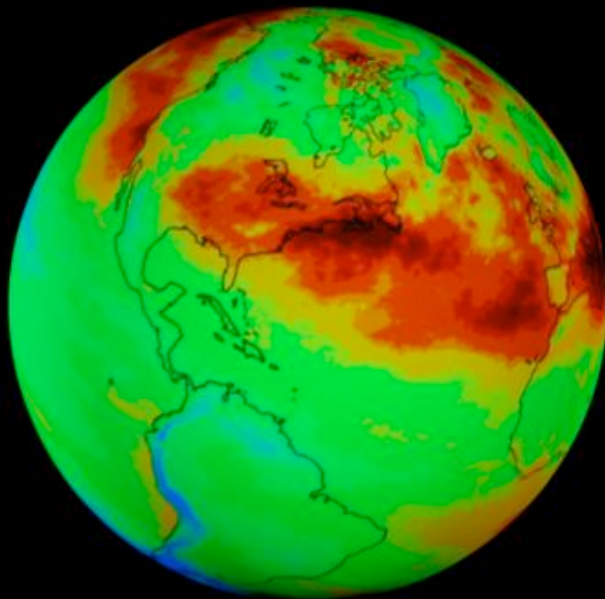


Aura Informal Education

Program: Aura Data on Science on a Sphere

Description: Aura data, including tropospheric ozone, nitrogen dioxide, and sulfur dioxide projected in three-dimensional space onto Sphere at GSFC Visitor Center

Target Audience: General Public





Science on a Sphere User Group



- NOAA funded development and deployment n=15+
- Content development and collaboration
- Technical enhancement
- \$2.4M in Outreach spending to date

- Interactive Experience
- Cross Platform content
- Formal Ed. Program
- Exhibit Hall setting
- News Media opp.s





SOS User Group

Museums hosting SOS

- Bishop Museum
- Imiloa
- Maryland Science Center
- McWane Science Center
- Orlando Science Center
- Science Museum of Minnesota
- Smithsonian Museum of Natural History
- The Tech Museum of Innovation

Agencies & Colleges hosting SOS

- Fiske Planetarium
- James Madison University
- NASA/GSFC
- National Maritime Museum of the Gulf of Mexico
- Nauticus
- NOAA Thunder Bay Marine Sanctuary

Content and Program providers

AMNH

Hampton University

Monadnock Media

University of Wisconsin

Animated Earth

Institute For Learning Innovation

NASA

NOAA

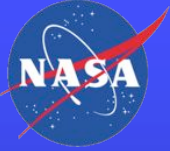
42 Degrees North



Partnership with NOAA

- SOS is a technology that provides a perfect venue for both NOAA & NASA data.
- A wealth of resources in both agencies to present science content.
- NASA offers a lot to SOS
 - ◆ NASA has pushed the envelope for content development on SOS
 - ◆ NASA offers expertise NOAA does not have: in working with networks of museums and science centers to create relationships that are mutually beneficial.
 - ◆ NASA has state of the art capabilities in information management and visualization software development





SOS Content Themes

IPY

Corals

Land use changes

Marine life's changing environment

Climate change



SOS Evaluations

Evaluations to go beyond visitor dwell time to assess the educational impact

Orienting first time viewer

User kiosks that control SOS

Explanation of scientific phenomenon

Impact of SOS in a formal ed program

How complex should the concepts be?

Misconceptions or lack of knowledge among viewers



Power to present Earth System Science in a way that captivates viewers...



Photo credit: Hampton University